

Initially, Applicants would like to thank the Examiner for the indication that Claims 9-11, 22, and 45 contain allowable subject matter.

In the Official Action, the Examiner objects to the drawings under 37 CFR 1.83(a). Specifically, the Examiner argues that the drawings must show every feature of the invention specified in the claims.

The Examiner argues that the combination of mechanical linkage comprising the scissor linkages and the support means comprising a spring means and a linear actuator in series as claimed in claims 10, 33, and its intervening claims is not shown in the drawings. Applicants respectfully submit that the same are illustrated in Figure 14 and referenced by numbers 171 and 170, respectively.

The Examiner also argues that the combination of mechanical linkage comprising the scissor linkages and the support means comprising an elastic means as claimed in claims 11, 34 and its intervening claims are not shown in the drawings. Applicants respectfully submit that the elastic means is shown in Figure 15 at reference numeral 180.

The Examiner also argues that the limitation of the tubular cavity being coiled in a helical manner as claimed in the 2nd line from the bottom of claim 18 as well as in claims 22 and 25 is not shown in the drawings. Applicants respectfully submit that the helically coiled tubular cavity is shown in Figure 6a at reference 340 and would be understood as such from the accompanying text at page 34.

The Examiner also argues that the limitation of the ramp in claims 23 and 48 is not shown in the drawings. Applicants respectfully submit that the ramp is shown in Figure 11 at reference numeral 140.

The Examiner also argues that the limitation of the bottom and top plates as claimed in claims 17, 22, and 44 are not shown in the drawings. Applicants respectfully submit that the top and bottom plates are shown in Figure 6(a) at reference numerals 336 and 332, respectively.

Lastly, the Examiner argues that the limitation in claim 8 wherein a first end of each of the first and second scissor sublinkages being fixed to the payload or a portion thereof is not shown in the drawings. Applicants respectfully submit that the same is shown in Figure 1 at reference numeral 109.

In view of the above, it is respectfully requested that the objection to the drawings under 37 CFR 1.83(a) be withdrawn.

In the Official Action, the Examiner objects to claim 36 because in line 1 thereof, "for" should be changed to --of--. In response, claim 36 has been amended as suggested by the Examiner. Accordingly, it is respectfully requested that the objection claim 36 be withdrawn.

In the Official Action, the Examiner rejects claims 17, 22, 23, 25, 44, and 48 under 35 § U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art

that the inventor, at the time the application was filed, had possession of the claimed invention.

With regard to claims 17, 22, and 44, the Examiner argues that the limitation of a bottom plate fixed to the payload or base structure and a top plate movable to the bottom plate and fixed to the other of the payload or a base structure is not described in such as way as to enable the same to one skilled in the art. Applicants respectfully submit that Figure 6 and page 34 of the specification describe such a structure and that those of ordinary skill in the art would understand that the top plate 336 is attached to one of the base or payload and the bottom plate 332 is attached to the other of the base or payload. However, the specification, at page 34 has been amended to further clarify such a configuration.

With regard to claims 23 and 48, the Examiner argues that the limitation of the ramp is not described in such as way as to enable the same to one skilled in the art. Applicants respectfully submit that the ramp is shown in Figure 11 and fully described in the accompanying text at page 44. However, the ramp is referred to in the specification as a sliding cam (140). To clarify that the ramp and sliding cam are the same component, the specification has been amended to indicate that the sliding cam is --alternatively referred to as a ramp--.

With regard to claim 25, the Examiner argues that the limitation of the payload and base structures being components of a rocket is not described in such as way as to enable the same to one skilled in the art. Applicants respectfully submit that the payload and base structures 101, 102 respectively are shown as part of a rocket in Figure 18 and discussed at page 26 of the specification in which the rocket is described as a launch vehicle. Those

skilled in the art would certainly understand a launch vehicle to be alternatively referred to as a rocket.

In view of the above, it is respectfully requested that the objection to claims 17, 22, 23, 25, 44, and 48 under 35 U.S.C. § 112, first paragraph, be withdrawn.

In the Official Action, the Examiner rejects claims 1-26, 29, and 36-49 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1, 36, and 39, the Examiner argues that it is unclear whether the applicant is claiming the combination of a payload isolation system and a payload and base structure or the subcombination of a payload isolation system and its components. Applicants respectfully submit that the subcombination of a payload isolation system. Neither the payload nor the base structure is positively recited in claims 1, 36, or 39.

With regard to claims 4, 8, and 29, the Examiner argues that the distinction between a parallelogram linkage/scissor linkage and a parallelogram sublinkage/scissor sublinkage is unclear since Figure 1 element 105 and 104 represent the upper and lower parallelogram linkages (not sublinkages as claimed) which share a common member 107. Applicants respectfully submit that the entire linkage shown in Figure 1 is made up of links 105, 106, and 107 (along with the corresponding surfaces of the payload and base structure). The entire linkage comprises two sublinkages, one of which is defined by links 105 and 107 along with the surface of the payload, the other of which is defined by links 106 and 107 along with the surface of the base structure.

With regard to claims 5 and 9, the Examiner argues that there is insufficient antecedent basis for "the parallelogram linkages" in lines 1 and 2 from the bottom. In response, claims 5 and 9 have been amended to provide the proper antecedent basis.

With regard to claims 10 and 11, the Examiner argues that there is insufficient antecedent basis for "the first or second common members" in lines 1 and 2 from the bottom. Applicants respectfully submit that claims 10 and 11 depend from claim 8 which provides antecedent basis for "the first or second common members" on line 5 thereof.

With regard to claim 21, the Examiner argues that the difference between the deformable mat of claim 21 and the support means of claim 1 is unclear and further argues that the specification teaches the deformable member as being the support means. In response, claim 21 has been amended to clarify that the support means comprises the deformable mat and that the support adjustment means comprises the remaining limitations in the claim.

With regard to claim 23, the Examiner argues that the phrase "more or less" does not define the metes and bounds of the claim. In response, claim 23 has been amended to clarify the metes and bounds of what is recited therein.

With regard to claim 39, the Examiner argues that the difference between the support adjustment means and the effective payload adjustment means is unclear and suggests numbering the elements clearly in the drawing. In response claim 39 has been amended to correct the recitation of the "support adjustment means" to the --support means--.

In view of the above, it is respectfully requested that the rejection of claims 1-26, 29, and 36-49 under 35 U.S.C. § 112, second paragraph, be withdrawn.

In the Official Action, the Examiner rejects claims 1-5, 8, 12, 13, 27-32, 35-38 under 35 U.S.C. § 102(b) as being anticipated by Macpherson. Additionally, the Examiner rejects claims 1, 6, and 7 under 35 U.S.C. § 102(b) as being anticipated by Sutcliffe.

Furthermore, the Examiner rejects claims 1, 19-21, and 23 under 35 U.S.C. § 102(b) as being anticipated by Whelpley. Lastly, the Examiner also rejects claim 1 under 35 U.S.C. § 102(b) as being anticipated by Marshall. In response, Applicants respectfully traverse the Examiner's rejections under 35 U.S.C. § 102(a) for at least the reasons set forth below.

In the Official Action, the Examiner rejects claims 14-16 under 35 U.S.C. § 103(a) as being unpatentable over Sutcliffe in view of Nathan. Additionally, the Examiner rejects claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Sutcliffe in view of Goldbach. The Examiner also rejects claim 18 under 35 U.S.C. § 103(a) as being unpatentable over Sutcliffe and Nathan in view of Ganser. Furthermore, the Examiner rejects claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Whelpley in view of Ivers. The Examiner also rejects claim 25 under 35 U.S.C. § 103(a) as being unpatentable over Sutcliffe. Additionally, the Examiner rejects claim 26 under 35 U.S.C. § 103(a) as being unpatentable over Marshall in view of Nathan. The Examiner also rejects claim 39 under 35 U.S.C. § 103(a) as being unpatentable over Schubert in view of Nathan. Furthermore, the Examiner rejects claims 39-41 and 46-48 under 35 U.S.C. § 103(a) as being unpatentable over Whelpley in view of Nathan. The Examiner also rejects claims 42 and 43 under 35 U.S.C. § 103(a) as being unpatentable over Whelpley and Nathan in view of Marshall. Furthermore, the Examiner rejects claim 44 under 35 U.S.C. § 103(a) as being unpatentable over Schubert and

Nathan in view of Goldbach. Lastly, the Examiner rejects claim 49 under 35 U.S.C. § 103(a) as being unpatentable over Whelpley and Nathan in view of Ivers. In response, Applicants respectfully traverse the Examiner's rejections under 35 U.S.C. § 103(a) for at least the reasons set forth below.

With regard to the rejections under 35 U.S.C. 102(b), Applicants respectfully submit that the Sutcliffe, Whelpley, and Marshall references do not teach maintaining a payload and base in a parallel relationship and that the Macpherson reference does not teach a support means which suppresses vertical and horizontal vibrations. Member 18 in Sutcliffe is an elastic block which does not maintain a parallel relationship. Component 88 of Whelpley and component 100 of Marshall also do not maintain a parallel relationship, the payload can tilt. Furthermore, component 11 of Macpherson is not a support means and does not provide a vertical or lateral support to suppress transmission or a vertical or lateral vibrations. Macpherson merely shows a jack which has no degrees of freedom. If the jack of Macpherson is pushed laterally or vertically, it will not move.

Therefore, a support system, a mechanism and a method for maintaining a parallel relationship between a base and payload as claimed in independent claims 1, 27, and 36, is nowhere disclosed in either Sutcliffe, Whelpley, Macpherson or Marshall. Since it has been decided that "anticipation requires the presence in a single prior art reference, disclosure of each and every element of the claimed invention, arranged as in the claim,"¹ independent claims 1, 27, and 36 are not anticipated by Sutcliffe, Whelpley, Macpherson or Marshall. Accordingly, independent claims 1, 27, and 36 patentably distinguish over Sutcliffe,

¹ Lindeman Maschinenfabrik GMBH v. American Hoist and Derrick Company, 730 F.2d 1452, 1458; 221 U.S.P.Q. 481, 485 (Fed. Cir., 1984).

Whelpley, Macpherson or Marshall and are allowable. Claims 2-8, 12, 13, 19-21, 23, 28-32, 35, 37, and 38 being dependent upon claims 1, 27, and 36, are thus allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejections of claims 1-8, 12, 13, 19-21, 23, 27-32, 35, 37, and 38 under 35 U.S.C. § 102(b).

With regard to the rejections under 35 U.S.C. § 103(a), as discussed above, neither Sutcliffe nor Whelpley disclose maintaining a base and payload in a parallel relationship. Further Goldbach does not teach first and second plates that are movable relative to each other; and Sutcliffe does not discuss the change in effective weight of the payload which is not inherent in the art of machinery mounts, as argued by the Examiner since machines do not have a varying weight.

Thus, independent claims 1 and 39, are not rendered obvious by the cited references because none of the cited references, whether taken alone or in combination, teach or suggest a support system and apparatus for maintaining a parallel relationship between a base and payload as recited in claims 1 and 39. Accordingly, claims 1 and 39 patentably distinguish over the prior art and are allowable. Claims 14-18, 24-26, 39-44, and 46-49, being dependent upon claims 1 and 39, are thus allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejection of claims 14-18, 24-26, 39-44, and 46-49 under 35 U.S.C. § 103(a).

Further, Applicants respectfully submit that there is no motivation or suggestion to combine the secondary references with the primary references. The U.S. Court of Appeals for the Federal Circuit (the "Federal Circuit") restated the legal test applicable to

rejections under 35 U.S.C. § 103(a) (*In re Rouffet*, 47 USPQ2d 1453 (Fed. Cir., July 15, 1998)). The Court stated:

[V]irtually all [inventions] are combinations of old elements. Therefore an Examiner may often find every element of a claimed invention in the prior art. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an Examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." To prevent the use of hind sight based on the invention to defeat patentability of the invention, this court requires the Examiner to show a motivation to combine the references that create the case of obviousness. The Board [of Appeals] did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of the art. If such a rote indication could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct **the suggestion to combine requirements stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.**

In re Rouffet, 47 USPQ2d 1457-58 (Fed. Cir., July 15, 1998) (citations omitted, emphasis added).

More recently, the Federal Circuit again dealt with what is required to show a motivation to combine references under 35 U.S.C. § 103(a). In this case the court reversed the decision of the Board of appeals stating:

[R]ather than pointing to specific information in Holiday or Shapiro that suggest the combination..., the Board instead described in detail the similarities between the Holiday and Shapiro references and the claimed invention, noting that one reference or the other-in combination with each other... described all of the limitations of the pending claims. Nowhere does the Board particularly identify any suggestion, teaching, or motivation to combine the ... references, nor does the Board make specific-or even inferential-findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or any factual findings that might serve to support a proper obviousness analysis.

In re Dembiczak, 50 USPQ2d 1614, 1618 (Fed. Cir., April 28, 1999) (citations omitted).

Thus, from both *In re Rouffet* and *In re Dembiczak* it is clear that the Federal Circuit requires a specific identification of a suggestion, motivation, or teaching why one of ordinary skill in the art would have been motivated to select the references and combine them. This the Examiner has not done. The Examiner merely states that it would be obvious to combine a resilient support with a deformable member having nonlinear characteristics "in order to provide specific deformation characteristics under certain load conditions. The Examiner makes this statement without considering if the prior art appreciated this need or whether the cited references contemplated such a combination. Therefore, Applicants respectfully submit that the Examiner has not met his burden of identifying a motivation or suggestion to combine references and is using the claims as a blueprint to piece together the claimed elements from the prior art.

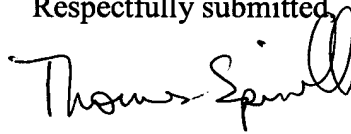
Thus, Applicants respectfully submit that the Examiner, without identifying a suggestion, motivation, or teaching for combining the references, has used impermissible hindsight to reject claims 14-18, 24-26, 39-44, and 46-49 under 35 U.S.C. 103(a). As discussed above, the Federal Circuit in *In re Rouffet* stated that virtually all inventions are combinations of old elements. Therefore an Examiner may often find every element of a claimed invention in the prior art. To prevent the use of hindsight based on the invention to defeat patentability of the invention, the Examiner is required to show a motivation to combine the references that create the case of obviousness. Applicants respectfully submit that the Examiner has not met this burden.

In light of the state of the law as set forth by the Federal Circuit and the Examiner's lack of specificity with regard to the motivation to combine the cited references, the applicants also respectfully submit that the rejections for obviousness under 35 U.S.C. 103(a) lack the requisite motivation and must be withdrawn.

Attached hereto is a marked-up version of the changes made to the application by the current amendment. The attached page is captioned **"Version with Markings to Show Changes Made."**

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



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Enclosure (Version with Markings to Show Changes Made)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning on line 6 of page 34 has been amended as follows:

Figure 6a shows a view of the cross section of a second preferred embodiment of the vertical load support means 30, here indicated as the vertical support means 300. In this design, a preferably extruded tubular element of elastomeric material 360 as shown in Figure 6b and similar to those described for the elastomeric tubular elements in Figure 4, with similar arch shape elements 338 and 339, are used to construct the vertical support element 300. The vertical support element 300 consists of a preferably cylindrical housing 340 with the side wall 341, a top 336, and a bottom plate 332. The top plate 336 is attached to one of the base or payload and the bottom plate 332 is attached to the other of the base or payload. *only way shown.* A shaft 331 is attached rigidly to the center of the bottom plate 332 and rides in the bushing 333 to provide for free travel of the bottom plate 332 in the direction parallel to the long axis of the cylinder 341. Other means, such as sliding guides, linear ball bushings or mechanical linkages may also be used to constrain the bottom plate 332 to motions parallel to the long axis of the cylinder 341. The tubular elastomeric element is placed within the internal cavity of the vertical support element 300 by winding it like a rope in a helical manner to fill out the entire cavity. During the assembly, the contacting side surfaces 342 and the contacting top and bottom surfaces 343 and 344 of the tubular elastomeric element are preferably bonded by an appropriate adhesive material. The resulting vertical support means 300 would resist the compressive force 350 in a manner similar to that described for the vertical support means 30

and similarly exhibit a nonlinear load-deflection characteristic, which can be varied by varying the geometry of the tubular elastomeric element 360.

The paragraph beginning on line 22 of page 44 has been amended as follows:

A mechanism to effect this adjustment of quasi-static load bearing capability, by changing the effective footprint area within which the load 31 bears upon load support 30, is illustrated in Figure 11 in which 140 is a sliding cam (alternatively referred to as a ramp) which is pulled by adjustment coupling 52 under a structure which includes load support means 30. The sliding cam 140 slides upon a surface of or affixed to base structure 102, and the payload 101 is above and rests on the support means 30. As the cam 140 undergoes motion 141 to the right, it lifts an increasing area of support means 30 into the load bearing position, where it is then held by well known latching means so that, for example, a portion 142 of support means 30 is in load bearing position where sliding cam has 140 has passed and lifted it, but another portion 143 ahead of the cam 140 is slack and uncompressed and makes no contribution to the support of the load 31 because it has not yet been lifted into position by the cam 140. In this manner, the compressive pressure exerted by the payload in the form of force 31 on the mat-form of support means 30 remains nominally constant.

IN THE CLAIMS:

The claims have been amended as follows:

5. (Amended) The payload isolation system of claim 4, wherein the at least one parallelogram linkage comprises two or more parallelogram linkages wherein at least two of the two or more parallelogram linkages are configured non-parallel to each other.

9. (Amended) The payload isolation system of claim 8, wherein the at least one scissor linkage comprises two or more scissor linkages, at least two of the [parallelogram] two or more scissor linkages being configured non-parallel to each other.

21. (Amended) The payload isolation system of claim 20, wherein the support [adjustment] means comprises:

a deformable mat having at least one internal tubular cavity; and wherein the

support adjustment means comprises:

a gas source in communication with the at least one internal cavity;

wherein the feedback means controls the gas pressure level in the internal tubular cavity in response to the change in relative distance between the payload and the base structure.

23. (Amended) The payload isolation system of claim 20, wherein the support adjustment means comprises:

a deformable mat having at least one internal tubular cavity; and

a ramp means for engaging the deformable mat to vary an amount of surface area in contact with the payload; and

drive means for driving the ramp means between locations [in] which [more or less] varies an amount of surface area [is] in contact with the payload;

wherein the feedback means controls the drive means to change the amount of surface area in contact with the payload.

36. (Amended) A method [for] of constraining motion between a payload and a base structure, the method comprising the steps of:

providing a first mechanical linkage disposed between the payload and the base structure;

providing at least a second mechanical linkage disposed between the payload and the base structure; and

arranging the first and at least second mechanical linkages relative to each other such that the first and at least second mechanical linkages maintain a parallel relationship between the payload and the base structure.

39. (Amended) A support apparatus for providing vertical and/or lateral support of a payload relative to the base structure such that the transmission of vertical and/or lateral vibration between the payload and the base structure are suppressed, the support apparatus comprising:

a deformable member exhibiting nonlinear elastic characteristics in response to an effective payload weight;

support [adjustment] means for supporting the effective payload weight; and

effective payload adjustment means for adjusting the level of support of the support means in response to a varying effective payload weight.